Year 10 Physics Course outline

	Students have two lessons per cycle taught by specialist Physics teachers. Homework is set once per cycle.		
	Topic and approximate duration	**Key learning areas**	**Homework Options Students will be guided by the class teacher as to which task to complete (according to target grade)**
Autumn Term 1	**Topic: Electricity**	Students will begin the electricity topic, where students will initially learn about circuit symbols and how electricity or electrical current passes through wires to transfer energy to components. They will gain an understanding of the key terms, including current, potential difference and resistance, and understand how they are linked together. They will also learn to qualitatively apply these key terms to series and parallel circuits Students will continually re-cap the key terms and rules learned in the previous lessons and move onto learning about how to build circuits, where students will check the rules of circuits are valid and complete assessed practicals on current-potential difference relationships and factors affecting resistance.	1. Circuit diagrams 2. Current 3. Potential difference 4. Series and Parallel Circuits 5. Resistance.
	Nature of landmark assessment	Longer answer question mid topic assessment and short and longer answer questions end of topic assessment	

Autumnterm 2	**Topic: Electricity (continued)**	The formula for charge, energy, power and potential difference will also be applied, combining numeracy skills with the ability to obtain values from written information and circuits. Students will learn about the applications of thermistors (temperature dependant resistors) and LDRs (light dependant resistors) and be able to explain how other components are affected when these components vary their resistance. Students will then go on to learn about mains electricity, how to wire a plug and the cause of electric shocks. **Assessed practical: Factors affecting resistance** **Assessed practical: I-V graphs** **Separate science students** will then go on to learn about static electricity and electric fields.	1. Plotting I-V graphs 2. Plotting resistance-length graphs 3. Power calculations 4. Applications of thermistors and LDRs 5. Extended writing - explaining the design and function of a transformer 6. Extended writing - explaining the function of different types of circuit breaker
	Nature of Assessment	Interim focused primarily on Electricity topic	
Springterm1	**Topic: Forces and motion**	Students should be able to calculate average speed and explain the difference between speed and velocity. They will study and draw motion graphs to represent change in distance or displacement over time and also change in velocity over time. They should be able to describe the effects of several forces acting on an object and link this to resultant force, acceleration and terminal velocity. Students will be able to apply Newton's laws of motion in explaining the motion of objects in varying situations. Students will be able to calculate braking force and qualitatively explain how it changes in different systems. Stopping distance (braking distance + thinking distance) will be also studied for vehicles, with factors affecting the braking distance being categorised. **Assessed practical 7: Investigate the relationships between force, mass and acceleration.**	1. Drawing d-t graphs and calculating speed 2. Drawing v-t graphs and calculating acceleration and distance 3. Extended writing task: explaining terminal velocity 4. Acceleration calculations 5. Extended writing/exam Q: Explaining how factors which affect stopping distance. 6. Extended writing - explaining terminal velocity
	Nature of landmark assessment	Longer answer question mid topic assessment and short and longer answer questions end of topic assessment	

Spring term 2	**Topic: Forces and motion (continued)** **Topic: Waves**	Students will continue their understanding by learning about the conservation of momentum. Within this they will understand the concept of momentum, make momentum calculations and explain, using qualitative and quantitative examples, how safety features in vehicles work. This is due to reducing the rate of change of momentum, by increasing the time of impact, which reduces the force. **Separate science students** will go on to study changes to momentum and how this relates to Newton's laws and impact forces. Students will then begin the waves topic. Wave behaviour is common in both natural and human-made systems. Waves carry energy from one place to another and can also carry information. Designing comfortable and safe structures such as bridges, houses and music performance halls requires an understanding of mechanical waves. Modern technologies such as imaging and communication systems show how we can make the most of electromagnetic waves. Students will understand the properties of both transverse and longitudinal waves and use this knowledge to calculate wave speed. Practical skills will be developed in an assessed demo which allows students to calculate the speed of a wave on string and water waves. **Assessed practical: Calculating the speed of a water wave** **Assessed practical: Calculating the speed of a wave on string**	1. Momentum calculations 2. Extended writing - explaining how seat belts improve safety 3. Wave speed calculations 4. Extended writing - plan how to investigate the speed of a water wave
	Nature of landmark assessment	End of Year Test: Longer answer question mid topic assessment and short and longer answer questions end of topic assessment	
Summer Term 1	**Topic: Revision (up to 2 weeks)+ exams (2 weeks)** **Waves:**	Students will revise for two weeks in preparation of the end of year exams. These will cover all content from Y9 and Y10 to date. Students will continue the waves topic by studying converging and diverging lenses. They will be expected to draw accurate ray diagrams showing how light passing through them will create an image. They should then be able to describe the image using key-terms.	1. Ray diagrams for converging lens' at different distances away 2. Diverging lens diagrams

		Light will then be understood in terms of why we see images, and also the effect of filters and different colours of light being shone on different coloured objects.	
	Nature of landmark assessment	Longer answer question mid topic assessment and short and longer answer questions end of topic assessment on all topics studied in Year 9 and Year 10 during assessment week.	
Summer Term 2	**Topic: Waves**	Finally, EM radiation will be linked to temperature and temperature change, allowing students to understand what 'hot' means and what is taking place in heating and cooling in terms of infra-red radiation	1. Practical skills - investigating IR on heating or cooling objects
	Nature of landmark assessment	Interim focused primarily on Waves topic	